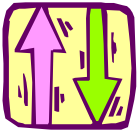# *EXECUTIVE SUMMARY*

The Central Coast Region of California encompasses the counties of Santa Cruz, San Benito, Monterey, San Luis Obispo, and Santa Barbara. Although the region has seen the implementation of some basic technology-based strategies or intelligent transportation systems (ITS) applications, there has not been a comprehensive, systematic look at ITS opportunities until now. This effort to develop an ITS Strategic Deployment Plan (Strategic Plan) is part of a comprehensive undertaking by the Central Coast partner agencies to map out and coordinate ITS opportunities. The primary objective of the Strategic Plan is to help the Central Coast counties to define their transportation-related needs in the region. Then, with this foundation firmly in-place, to identify potential ITS solutions that mitigate/address the identified problems

E.1 CENTRAL COAST ITS OVERVIEW

To say that the last decade was one of rapid technological advancement is an understatement. Computers and communications technologies have affected virtually every aspect of life. This is particularly evident in the field of transportation. Systems now exist that will unlock a car from thousands of miles away, that provide unlimited information on products and services both at home and on the road, that serve as our electronic "back seat driver," and that will extract money from a credit card at 70 miles per hour. Like it or not, computers and electronics are changing our lives, including the way we travel. While much of this energy is coming from the private sector, responsibility also lies with governmental agencies to harness these opportunities and use them to improve the lives of the citizens they represent.

This report, the **Intelligent Transportation Systems Strategic Plan,** identifies these technology-based opportunities for improving the transportation system in the Central Coast Region. Intelligent Transportation Systems (ITS) have been defined as:

"The application of advanced sensor, computer, electronics, and communication technologies and management strategies to increase the safety and efficiency of the surface transportation system."

For the purposes of this project, the Central Coast Region is defined as encompassing the counties

> *The Strategic Plan is a road map to implement an integrated system of technology-based transportation strategies.*

of Santa Cruz, San Benito, Monterey, San Luis Obispo, and Santa Barbara. The Central Coast ITS Strategic Plan is a road map to implement an integrated system of technology-based transportation strategies within this five-county region of California. The Strategic Plan has been prepared through a cooperative effort of agencies in these counties, plus the California Department of Transportation (Caltrans), the California Highway Patrol (CHP), the Federal Highway Administration (FHWA), and the Federal Transit Administration (FTA).

While ITS incorporates many new and emerging technologies, such systems are not completely new to the Central Coast. Transportation agencies in the Central Coast have already implemented technology-based solutions such as:

- Interconnected traffic signal control systems to improve traffic flow in larger downtown areas like Santa Barbara, San Luis Obispo, and Santa Cruz, as well as in smaller cities such as Hollister, Lompoc, Arroyo Grande, and approximately a dozen others

- Roadside motorist aid call boxes along highways in San Luis Obispo, Santa Barbara, and Santa Cruz counties to help in providing emergency and roadside assistance to motorists

- Closed circuit TV (CCTV) cameras on State Route (SR) 17 and SR 1 in Santa Cruz, and at the US 101/SR 156 interchange in Monterey County to help monitor congestion and respond to incidents and blockages more quickly

- Changeable message signs (CMS) on SR 17, SR 1, and SR 48 that provide motorists with roadway condition information to aid in their travel decisions

These activities are a partial foundation for a more complete set of integrated ITS applications that will help keep people and goods moving more safely and efficiently within and through the Central Coast in the coming decades. The expectation is that strategic use of technologies will benefit a broad cross-section of interests, such as tourism, movement of agricultural and other products, transit travelers, and auto drivers. It will also help local agencies with their jobs of managing congestion, providing mobility improvements, and improving air quality. To be most effective, the systems need to be integrated, sharing information that can be used within and outside the Central Coast Region to improve travel mobility and safety.

E.2 A VISION OF THE NOT-SO-DISTANT FUTURE

Imagine that it is the year 2010 and you are taking a trip from your home in Phoenix to visit friends in the Bay Area. You wisely decide to spend a couple of extra days enjoying the historic and weather-friendly Central Coast and, while you are there, see your college freshmen son at Cal Poly.

You are just beginning to learn, enjoy, and depend on the technological conveniences that are now available. You have checked out the websites in advance and find out from the Santa Barbara Trip Planner web page that you can take the train and that the buses provide service from the train stations to many of the places you want to go. Being an adventurous type, you leave your car at home, board an AMTRAK train, and head for the Central Coast.

Your first overnight stop is in Santa Barbara. The train arrives, and the sign at the station says "Bus to State Street arriving in 8 minutes." Thanks to good planning, the "smart card" for electronic transactions that works at home in Phoenix also works here. And you even received a discount on the bus because the card knows you came in on the train. Your Palm Pilot lets you know that there is a slight chance of rain later, so you take in a few sights, and settle in for the night.

The next day takes you by train to San Luis Obispo, just in time for Cal Poly's first football game of the season. The information kiosk at the hotel shows that the train will be about 30 minutes late, just enough time to do a little shopping. The bus system in San Luis Obispo thankfully takes the same "smart card", and you can avoid the parking hassles of getting to the game. After dinner, you make plans for a trip up America's most scenic road, SR 1 (Pacific Coast Highway), the next morning.

You rent a car locally, and the navigation unit directs you the fastest way out of town. But it also alerts you to a possible closure, due to recent slide activity. The changeable message sign (CMS) on US 101 approaching SR 1 confirms that that road is now open, and you proceed. After your drive along the coast, you arrive at the Monterey Peninsula. The toll for 17-Mile Drive, parking at Cannery Row, clothing, and dinner can all be paid with your "smart card".

Following a drive up the coast the next morning you proceed to Santa Cruz for a golf reunion with your associates. But after stopping by the fruit and vegetable stand in Castroville, the rental car's left front tire goes flat. Fortunately, the rental car has a "mayday" system that sends out a distress signal, and the rental car company knows exactly where you are. You are back on the road in 30 minutes. Golf proves to be so enjoyable in Santa Cruz that you decide to stay for three
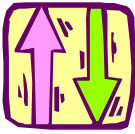
days instead of one, forgoing your plans to see San Francisco until another time. As your trip comes to a close and you depart for the airport, you are unaware to the fact that an incident was recently cleared on SR 17, 30 minutes faster than it would have been otherwise, because of recent communications system improvements made by the CHP and local emergency services agencies. As the plane lifts off the runway, you cannot help but ponder how amazing it was that everything on your trip worked so well together. Little did you know how government and industry were at work on an ITS Strategic Plan 10 years earlier to set the foundation for this to occur. You will be back, and next time with your corporate retreat for 500 colleagues.

## E.3 ITS IN THE CENTRAL COAST - FROM VISION TO REALITY

The picture painted above is not so far fetched as we might have once imagined. The Internet has revolutionized the way we do business in less than five years. And now the Internet is accessible through wireless communications, which opens up worlds of possibilities for how and where information is delivered. At the same time, many transportation challenges remain. Travel is increasing, resulting in more congestion. Highway safety can be enhanced further, air quality problems still exist, and transit is an underutilized resource. Although the Central Coast is not as congested as major metropolitan areas, transportation challenges abound here as well. Solutions to these problems will take a multi-faceted approach, involving both traditional strategies and advanced technologies, where they make sense.

The Strategic Plan is a starting point for bringing these technological approaches together into an integrated plan. We do not expect that this system will be built right away, nor do we expect that government will achieve it alone. It will require a partnership of institutions, and a lot of it will occur without government involvement at all. The remainder of this Executive Summary describes how the Strategic Plan is structured, identifies some of the highlights, and indicates some of the probable keys to success. The body of the report tells the story in more detail.

> *The Strategic Plan is a starting point for bringing these technological approaches together into an integrated plan.*
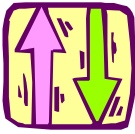
E.4 THE STRATEGIC PLAN ROAD MAP - A PROGRESSION FROM VISION TO PROJECT PRIORITIES

Though ITS, in one sense, is a relatively narrow field, it has begun to permeate virtually every dimension of transportation, just as computers are permeating so many facets of everyday life. This is partly why the dimensions of ITS are somewhat difficult to grasp. Not only are there many possible applications of ITS, but these applications and opportunities are changing on almost a daily basis. What may have looked like a good strategy a year ago becomes superseded by the next major innovation. How then does one plan in such a dynamic environment? The situation cries out for a "blueprint", a framework within which public agencies can make decisions about the ITS strategies to invest in and when may be the right time to invest.

We can think of the ITS strategy for the Central Coast in terms of a progression from an overall vision to priorities for specific projects. Exhibit E.1 illustrates the idea of a progression from the general (the vision) to the specific (project priorities).

A <u>vision</u> is simply a guide for where we want to go and, to an extent, how we want to get there. A <u>strategic direction</u> has been defined to support and provide additional detail to the vision. The strategic direction consists of general principles that apply as we seek to achieve the vision. The vision and related strategic direction for the Central Coast are defined in the body of the report.

> *A vision is simply a guide for where we want to go and, to an extent, how we want to get there.*

ITS <u>project concepts</u> have been defined that are appropriate to the Central Coast, both for the short- and long-term. ITS concepts can be thought of as types of ITS <u>recommended projects</u> that are not specific to a location or agency.
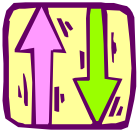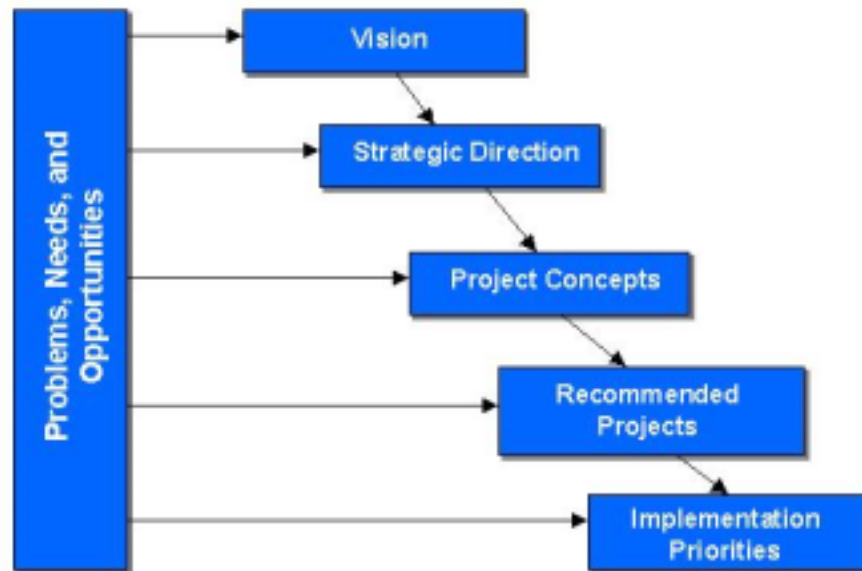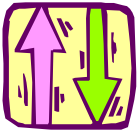
Exhibit E.1 - Strategic Plan Progression from Vision to Implementation Priorities

For example, an ITS concept might be closed circuit television (CCTV) monitoring of traffic; a <u>recommended project</u> would be "CCTV on US 101 throughout the Santa Barbara urban area." The Strategic Plan takes an inclusive approach to ITS concepts, to ensure the range of possible concepts can be accommodated in a <u>Regional ITS Architecture</u>. An architecture is simply a framework for how all the components of the system should ultimately fit together. We need to think inclusively, even though the concepts may be many years away from actual installation in some cases.

<u>Implementation priorities</u> then define which projects are likely to be deployed earlier than others. These priorities have been indicated in general short-, medium-, and long-term time frames, providing flexibility for Caltrans, CHP, and local agencies to make adjustments in priorities in response to funding availability and overall needs of the transportation system.
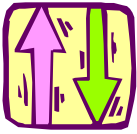
E.5 SOME HIGHLIGHTS OF THE ITS STRATEGIC DIRECTION IN THE CENTRAL COAST

One can think of the ITS strategic direction in the Central Coast in terms of both regional and county-level concepts. It is important to have a regional system to provide benefits to longer distance travel. More localized systems are needed to address needs and challenges at a more targeted level. Often, problems are common among local geographic areas, and agencies can benefit by addressing those issues in a consistent manner. Therefore, integration of regional and local systems through an effective communications network will help derive the maximum benefit from these investments, both regionally and locally. The Regional ITS Architecture shows how this integration can occur.

E.5.1 Regional Strategic Direction

A cornerstone of the ITS Strategic Plan for the Central Coast is the development of a **Transportation Management Center (TMC)**. A TMC can involve a variety of elements, but is typically associated with a situation where conditions in the field are monitored and decisions are made concerning traffic management, traveler information, incident response, and public safety. A TMC in California involves a partnership of Caltrans and the CHP. Up to this point, planning for the

Central Coast has focused on the development of a "satellite" TMC. The recommendation in the Strategic Plan is to move forward with a more fully functional TMC that has many of the elements of a TMC in a more urban setting, but that is tailored to the urban and rural character of the Central Coast. Personnel in charge of the TMC would:

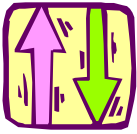Monitor traffic flow through roadway sensors and **CCTV cameras** at strategic locations

Control **ramp meters** installed in congested freeway sections to help traffic flow more smoothly

Serve as a focal point for regional traveler information that would include, for example, sending messages to strategically placed roadside **changeable message signs (CMS)** or **highway advisory radio (HAR)** systems and providing traveler information to kiosks located at rest areas, truck stops, etc. to allow long-distance traffic to avoid major incidents and road closures

Coordinate communications with the CHP to more rapidly respond to traffic incidents and better perform **incident management** activities

Caltrans and CHP will jointly plan for and develop the Central Coast TMC which will be located, at least temporarily, in San Luis Obispo and would have the capability for transfer of control to TMCs in either the San Francisco Bay Area or Southern California. For example, due to existing partnerships already established in the region, the Caltrans District 4 TMC (Bay Area) will have primary control over SR 17 and portions of SR 1 in Santa Cruz County. In these instances, the Central Coast TMC would have secondary control over these roadway segments. Decisions on the functions and capabilities of the Central Coast TMC will be made by Caltrans and CHP, with input from Regional and Local agencies.

Other ITS strategic directions recommended in this Plan include:
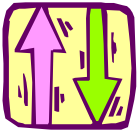
Increasing the availability and quality of multi-modal **traveler information** (e.g. roadway conditions, transit schedules, rail/train arrival times, tourism activities, etc.) generally by making regional and local information available over the Internet and telephone call-in systems

Improving traffic flow along roadways through **signal upgrades**, communications enhancements, and coordination strategies

Providing for a consistent **"smart card"** approach to provide for seamless operation among transit systems, parking systems, toll operations, and other transaction-based systems

Encouraging and working with communications companies to expand **cellular phone coverage** into more rural areas to more broadly support a range of information delivery options and possible "mayday" applications
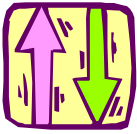
Support of enhancements and upgrades to CHP and emergency response agency **radio systems**
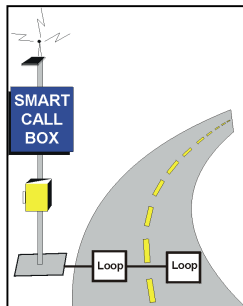
Improve emergency vehicle response times and transit vehicle schedule adherence through **traffic signal priority/pre-emption systems**

Use of the **Internet** to maximum potential to foster the sharing of information among agencies and with the public

Expanding the **motorist aid call box system** on targeted roadways in the Central Coast


Use of **"smart" call boxes** at selected locations that equip existing call boxes with roadway and/or weather sensors

The key to making this ITS strategic direction work at a regional level is integration. Integration in the form of the Central Coast Agencies working together, sharing information, and coordinating activities. Integration in the form of one Agency coordinating dispatching activities for an entire County, one Agency notifying its neighbors that there's been an incident and alternate routing should be considered, or one Agency installing a vehicle location system and having others use the same technology for both scale-of-economy and interoperability. This Strategic Plan provides the opportunity and the roadmap for the Central coast Agencies to jointly follow so that ITS integration is achieved from the onset.

E.5.2 Priority Projects in Santa Cruz County

- Dynamic traffic and incident management strategies (ramp metering and freeway/arterial coordination) on SR 1 and SR 17 to help provide congestion relief, including the possibility of High Occupancy Toll (HOT) lanes

- Transit vehicle tracking and information systems, including information at strategically located kiosks

- An upgraded communications network to enable improved signal coordination

- Parking management and information systems for the Santa Cruz boardwalk area
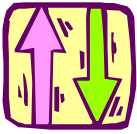
E.5.3 Priority Projects in San Benito County

- Installation of motorist aid call boxes along US 101, SR 25, and SR 156

- Upgrades to traffic signal systems to improve signal coordination

- Safety treatments on SR 156

- Traveler information systems (CMS and/or HAR) along US 101, SR 25, and SR 156

### E.5.4 Priority Projects in Monterey County

- Installation of motorist aid call boxes along US 101, SR 1, and SR 68 with particular sensitivity given to the visual aspects any installations along scenic roadways

- Traveler information systems (CMS and/or HAR) along US 101, SR 1, SR 68, and SR 156

- Upgrades to traffic signal systems to improve signal coordination

- Use of transit vehicle tracking systems to support transit operations

- Safety applications on rural highways

- A truck information service in the Salinas area to optimize freight routing and management

E.5.5 Priority Projects in San Luis Obispo County

- Transit vehicle tracking systems and "smart card" technologies (similar to those anticipated in Santa Barbara)

- Traveler information systems (CMS and/or HAR) along US 101, SR 1, and SR 46

- Upgrades to traffic signal systems to improve signal coordination and provide traffic signal priority/pre-emption for emergency vehicles

- Portable traffic management systems (PTMS) for use during construction projects and at major events such as the Cuesta Grade reconstruction, mid-state fair, and other events

- Advanced pedestrian crosswalks in downtown San Luis Obispo to improve intersection safety
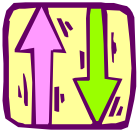
### E.5.6 Priority Projects in Santa Barbara County

- Several transit-oriented projects are listed: Automatic Vehicle Location (AVL – systems that track bus locations at any given moment), transit information systems, management systems, and maintenance systems to improve system efficiency

- Upgrades to traffic signal systems to improve the efficiency of traffic flow on arterial streets

- A trip planning system (the Santa Barbara County Trip Planner) that piggybacks on a system already functioning at the Southern California Association of Governments

- Travelers information system (CMS and/or HAR) along US 101, SR 1, and SR 154 that would provide notification of major incidents, road closures, slides, and weather conditions

- Dynamic traffic and incident management strategies (ramp meters and freeway/arterial coordination) on US 101 in Santa Barbara and Santa Maria, to help provide congestion relief (in conjunction with Caltrans

E.6 WHAT WILL MAKE THESE APPLICATIONS SUCCESSFUL?

Implementation of ITS raises challenges that are not typically present in other types of more traditional strategies. An ITS Project Implementation Guide is presented in Volume II of the Strategic Plan that highlights some keys to successful deployment of an ITS Project. Some of the key factors to remember include the following:

- Coordinate with partner agencies and integrate your systems with others (as appropriate) – think of the possible regional benefits of what you are doing, not just the local benefits

- Use proven technology – this will reduce the risk of failure and usually help to minimize maintenance costs

- Take advantage of as many private sector initiatives as possible – use of the Internet, wireless communications, and information services already offered by the private sector can help to contain costs

- Make sure the technological applications address specific needs – some of the monuments to failure have been systems installed mainly because the technology was impressive, but the need was lacking
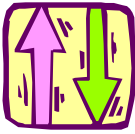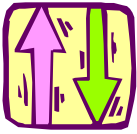
- Keep the applications as simple and straightforward as possible – greater complexity means greater costs for both installation and maintenance

- Consult individuals who know the intricacies of designing and procuring ITS – there is considerable expertise available through Caltrans, FHWA, and local agencies in larger metropolitan areas who can provide advice (a set of useful web sites is provided in ITS Volume II - Project Implementation Guide)

- Make sure that you have thought through how you will operate and maintain the systems – resources usually need to be devoted to keeping systems going once they are built

E.7 WHY SHOULD YOU BE INTERESTED IN THE STRATEGIC PLAN?

There are a number of important reasons why you should pay attention to the Strategic Plan:

- It represents a coordinated effort between agencies that have responsibility for planning and programming projects throughout the Central Coast and includes individual ITS Projects that should be implemented in the Central Coast as building blocks to this integrated system

- It contains information that will be helpful in implementing useful ITS Projects

- It contains ITS Projects for deployment that provide certain benefits that help meet regional and local air quality requirements/mandates

- It contains the Central Coast Regional ITS Architecture

    - Conformance with the Regional ITS Architecture ensures that ITS Projects in the Central Coast are eligible for Federal funding

    - Added role of the Metropolitan Planning Organizations (MPOs) and Council of Governments (COGs) to determine conformance at acceptable level to FHWA/FTA

- It contains ITS Projects for which Regional and Local agencies will need to determine funding priorities

    - ITS Projects are qualified for Federal and State funding/programs

    - ITS Projects will compete against more "traditional" transportation projects

    - Need to "mainstream" ITS Projects into the Central Coast's traditional transportation planning processes:

        - Regional Surface Transportation Plans (RSTPs)

        - Statewide Transportation Improvement Plans (STIP)

- Short- and Long- Range Transit Plans (SRTPs and LRTPs)
- Congestion Management Programs (CMPs)
- Congestion Mitigation and Air Quality (CMAQ) funds

E.8 NEXT STEPS

The next steps in the Strategic Plan involve its implementation. Lead agencies have been defined in the Plan, and these lead agencies will need to take the initiative to move ITS Projects forward by identifying funding, developing a design, and taking it through procurement. A list of action items has been provided in the Strategic Plan to identify specific activities for which individual agencies should be accountable. It is recommended that the ITS Steering Committee remain active, meeting on a periodic basis, to guide the implementation of the Plan. The Committee has served as an excellent forum for the exchange of information and resolution of issues, and can be a continuing vehicle for ensuring that ITS is integrated at the regional level.

The committee's membership should be further expanded to include additional stakeholders in the Central Coast such as the Air Quality Districts and local City agencies.